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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,390	04/20/2007	Thomas Hamelin	289755US6YA PCT	7051
22850 7590 11/16/2009 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER NUCKOLS, TIFFANY Z				
ART UNIT		PAPER NUMBER		
1792				
NOTIFICATION DATE		DELIVERY MODE		
11/16/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/587,390

**Applicant(s)**

HAMELIN, THOMAS

**Examiner**

TIFFANY NUCKOLS

**Art Unit**

1792

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) 32-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 and 45-47 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB-06)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of Group 1, claims 1-31 and 45-47 in the reply filed on 10/27/2009 is acknowledged.
2. Claims 32-44 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 10/27/2009.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1, 4, 10, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Application No. 2002/0050246 to Parkhe.**
5. In regards to Claim 1, Parkhe teach a substrate holder (*104 Fig. 2A*) for supporting a substrate (*102 Fig. 2A*) comprising a supporting surface (*103 Fig. 2A*) with a cooling component (*107, 207 Fig. 2A, Para. 0029*); a heating component positioned adjacent to the supporting surface and between the supporting surface and the cooling component (*105 Fig. 2A, Para. 0030*); a fluid gap (*236 Fig. 2A*) positioned between the cooling component and the heating component (*arrangement of 236 between 107 and 105 Fig. 2A*), the fluid gap configured to receive a fluid to vary the thermal conductance between the cooling component and the heating component implicitly through cooling

(*Para. 0044, 0050, 0051*); and a brazing material is disposed between the cooling component and the heating component, the brazing material disposed adjacent to the fluid gap implicitly to form a hermetic seal with the substrate support (*Para. 0042, Para. 0047*).

6. In regards to Claim 4, Parkhe teaches the cooling component comprises a top plate (238 *Fig. 2B*), i.e., an upper cap and a bottom plate (107 *Fig. 2B*) to form the total cooling component (207 *Fig. 2B*).

7. In regards to Claims 10 and 11, Parkhe teaches the fluid gap (236 *Fig. 2A*) is in the cooling component (107, 207 *Fig. 2B*).

#### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 5-7 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S.

Patent Application No. 2002/0050246 to Parkhe.

11. The teachings of Parkhe are relied upon as set forth in the above 102 rejection of Claim 4.

12. In regards to Claims 5-7, Parkhe teaches the lower cap has coil-shaped cooling channels configured to receive a cooling fluid therein, upper cap comprising a plate having a flat surface (*see 238 on 107 Fig. 2B*) that is positioned adjacent to the upper cap and the upper cap and the lower cap are brazed together, such that there is implicitly a brazing material there between (*Para. 0043-0045*).

13. Parkhe does not expressly teach the upper cap comprises a plurality of channels configured to receive a cooling fluid.

14. However, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to rearrange the upper and lower caps, such that the upper cap is now on top of the lower cap, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950). *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975). MPEP 2144.04-VI (c).

15. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to reverse the upper and lower caps, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. *In re Gazda*, 219 F.2d 449, 104 USPQ 400 (CCPA 1955). MPEP 2144.04 VI-A. The simple reversal of the upper and lower caps, such that the upper cap is not the lower cap and the lower cap is now the upper cap, would fulfill all of the limitations of claims 5-7 without changing the operation of the structures.

16. **Claims 13-20 and 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0050246 to Parkhe in view of U.S. Patent No. 3909917 to Lebedev et al.**

17. The teachings of Parkhe are relied upon as set forth in the above 102 rejection of Claim 1.

18. At the outset, it is noted in regards to Claim 26 that the recitation of "means for" limitations are considered to invoke the provisions of 35 U.S.C. 112, sixth paragraph. This recitation has been interpreted in accordance with the Specification and the dependent claims to refer to the following:

Claim 26:

- a. Means for preventing the flow of the brazing material into the contact zone: comprises a groove (Claim 27).

19. In regards to Claims 13-17, 19, and 26-31, Parkhe teaches that the cooling component (*Parkhe, 107 Fig. 2B*) and the heating component (*Parkhe, 105 Fig. 2B*) are brazed together (*Parkhe, Para. 0042*), such that the top surfaces that define the fluid gaps are implicitly brazed to the heating component, thus making brazing zones.

20. Parkhe does not expressly teach at least one isolating groove configured to prevent flow of the brazing material in the gap.

21. Lebedev et al teach that it is well known in the art in the method of brazing to place grooves in the *members* to be connected to prevent the running of the brazing filler from the zone of brazing where the brazing material is then collected (*Lebedev, Col. 1, lines 49-55*). The grooves, by this teaching, are located in both members and

near if not in, the zones of brazing, implicitly, as the function of the preventing the running of the brazing filler from the brazing zones would not be accomplished otherwise. This prevents the brazing material from having a chemical reaction with the materials being connected and prevents the deterioration of the brazed joint at high temperatures (*Lebedev, Col. 1, lines 38-48*).

22. It would have been obvious to one of ordinary skill of the art at the time of the invention to modify the substrate holder of Parkhe by adding grooves into the cooling and heating components of Parkhe, thus forming a plurality of grooves, near or in the brazing zones, as taught by Lebedev et al. One would be motivated to do so to prevent the brazing material from having a chemical reaction with the materials being connected and prevent the deterioration of the brazed joint at high temperatures. The grooves trap the brazing material in the zone of brazing, such that the flow of the brazing material is contained in the brazing zones and thus are configured to prevent the flow of the brazing material into the fluid gaps. The resulting apparatus, with isolating grooves in the heating and cooling components, fulfills the limitations of claims 13-17, 19, and 26-31.

23. In regards to Claims 18 and 20, Parkhe in view of Lebedev et al do not expressly teach the grooves are concentric.

24. However, Parkhe does teach that the brazing zones, which are in the same shape as the cooling fluid gap grooves as they form those grooves, are coil shaped and thus the isolating grooves are also coil shaped as the grooves are near or in the brazing zones to trap the brazing material.

25. Furthermore, a change of shape is generally recognized as being within the skill of one of ordinary skill in the art. It is noted that Applicant has not made any showing of criticality shape of the isolating grooves (or the fluid gap grooves) that would tend to point toward the non-obviousness of freely selecting a concentric shape as a matter of choice. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). See MPEP 2144.04 IV B.

26. **Claims 2, 3, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0050246 to Parkhe in view of U.S. Patent No. 5280156 to Niori et al.**

27. The teachings of Parkhe are relied upon as set forth in the above 102 rejection of Claim 1.

28. In regards to Claims 2, 3, 8, and 9, Parkhe does not expressly teach the heating component is comprised of a body portion and an embedded heater disposed in the body portion.

29. Niori et al teach a wafer heating apparatus with a heating element (*Niori*, 3 *Fig. 1*, 3), i.e., heater, embedded in a ceramic substrate (*Niori*, 2 *Fig. 1*, 2a/b *Fig. 3*), i.e., a body portion (*Niori*, *Claim 1*, *Col. 4 lines 11-27*). Niori et al teach the body portion is made of aluminum nitride (*Niori*, *Col. 5 lines 45-64*) such that the embedded heater is implicitly case in the body of aluminum nitride, an aluminum alloy. Niori et al further teach that the heater has a supporting surface (*Niori*, 4A *Fig. 3*) for a substrate (*Niori*, *W Fig. 3*) that is mechanically connected to the heater via an adhesive material (*Niori*, 5A *Fig. 3*, and *Col. 6 line 50-Col. 7 line 31*).



30. It would have been obvious to one of ordinary skill in the art at the time of the invention, with a reasonable expectation of success, to alternatively substitute the heating component in Parkhe with the heating component as taught by Niori et al, as art-recognized equivalent means for providing heat to a substrate. It has been held that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). See MPEP 2144.06 II. The resulting apparatus fulfills the limitations of claims 2, 3, 8, and 9.

31. **Claims 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0050246 to Parkhe in view of U.S. Patent No. 3909917 to Lebedev et al, as applied to Claim 19 above, and in further view of U.S. Patent No. 5280156 to Niori et al.**

32. The teachings of Parkhe in view of Lebedev are relied upon as set forth in the above 103 rejection of Claim 19.

33. In regards to Claims 21-25, Parkhe teaches the cooling component (*Parkhe*, 107 and 238) are made of the same material (*Parkhe*, Para. 0046). Parkhe further teaches of a separate embodiment the upper cap (*Parkhe*, 107) is made of aluminum nitride (*Parkhe*, Para. 0049).

34. It has been held that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination. See MPEP 2144.07. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297

(1945). Thus it would be prima facie obvious to one of ordinary skill in the art at the time of the invention to make the upper cap out of aluminum nitride, an aluminum alloy.

35. Parkhe does not expressly teach the heating component is made of an aluminum alloy.

36. Niori et al teach a wafer heating apparatus with a heating element (*Niori, 3 Fig. 1, 3*), i.e., heater, embedded in a ceramic substrate (*Niori, 2 Fig. 1, 2a/b Fig. 3*), i.e., a body portion (*Niori, Claim 1, Col. 4 lines 11-27*). Niori et al teach the body portion is made of aluminum nitride (*Niori, Col. 5 lines 45-64*) such that the embedded heater is implicitly case in the body of aluminum nitride, an aluminum alloy. Niori et al further teach that the heater has a supporting surface (*Niori, 4A Fig. 3*) for a substrate (*Niori, W Fig. 3*) that is mechanically connected to the heater via an adhesive material (*Niori, 5A Fig. 3, and Col. 6 line 50-Col. 7 line 31*).

37. It would have been obvious to one of ordinary skill in the art at the time of the invention, with a reasonable expectation of success, to alternatively substitute the heating component in Parkhe in view of with the heating component as taught by Niori et al, as art-recognized equivalent means for providing heat to a substrate. It has been held that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). See MPEP 2144.06 II. The resulting apparatus fulfills the limitations of claims 21-25, as the heating component and the cooling components are made of the same aluminum alloy, with a heater embedded in the body of the heating component.

38. **Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0050246 to Parkhe in view of U.S. Patent No. 5078851 to Nishihata et al**

39. The teachings of Parkhe are relied upon as set forth in the above 102 rejection of Claim 10.

40. In regards to Claim 12, Parkhe does not expressly teach the fluid gap groove is disposed in the heating component.

41. Nishihata et al teach a substrate holder (*Nishihata, Fig. 4*) with a heating component (*Nishihata, 20 Fig. 4*) with a fluid gap groove (*Nishihata, 34 Fig. 4*) in the heating component (*Nishihata, Col. 7 lines 55 - Col. 8 line 11*).

42. Because it is known in the art to include either a fluid gap groove with the heating component, and the results of the combination would be predictable, namely, an effective way to control the temperature of the substrate, it would have been obvious to one of ordinary skill in the art at the time of the invention to have a fluid gap groove with the heating component. The resulting apparatus would yield the claimed invention. See MPEP 2143 Rationale A.

43. **Claims 45-47 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0050246 to Parkhe in view of U.S. Patent No. 6051074 to Strodbeck et al and .**

44. At the outset, it is noted in regards to Claim 45 that the recitation of "means for" limitations are considered to invoke the provisions of 35 U.S.C. 112, sixth paragraph.

This recitation has been interpreted in accordance with the Specification and the dependent claims to refer to the following:

Claim 45

- b. Means for cooling the supporting surface: a thermoelectric device (Claim 46).
  - c. Means for heating the supporting surface: a thermoelectric device and a channel configured to flow at least one of elevated temperature fluorinated dielectric liquid, water, and steam (Claim 46).
  - d. Means for receiving a fluid: channel (Claim 47).
  - e. Means for connecting the means for cooling and the means for heating: brazing, Paragraph 0036.
45. In regards to Claims 45-47, Parkhe teaches a substrate holder (*Parkhe, 104 Fig. 2A*) for supporting a substrate (*Parkhe, 102 Fig. 2A*) comprising a supporting surface (*Parkhe, 103 Fig. 2A*) with a cooling component (*Parkhe, 107, 207 Fig. 2A, Para. 0029*) that implicitly cools the supporting surface by being part of the substrate holder; a heating component positioned adjacent to the supporting surface and between the supporting surface and the cooling component (*Parkhe, 105 Fig. 2A, Para. 0030*); a fluid gap (*Parkhe, 236 Fig. 2A*) positioned between the cooling component and the heating component (*Parkhe, arrangement of 236 between 107 and 105 Fig. 2A*), the fluid gap configured to receive a fluid to vary the thermal conductance between the cooling component and the heating component implicitly through cooling (*Parkhe, Para. 0044, 0050, 0051*); and a brazing material is disposed between the cooling component and

the heating component, the brazing material disposed adjacent to the fluid gap implicitly to form a hermetic seal with the substrate support (*Parkhe, Para. 0042, Para. 0047*).

46. Parkhe does not teach the means for cooling the supporting surface is a thermoelectric device.

47. Strodbeck et al teach a substrate support (*Strodbeck, 12*) where the cooling apparatus therein is a thermoelectric cooling unit (*Strodbeck, Col. 5 line 15-Col. 6 line 11, Claim 1*).

48. It would have been obvious to one of ordinary skill in the art at the time of the invention, with a reasonable expectation of success, to alternatively substitute the cooling component in Parkhe with the thermoelectric cooling means as taught by Strodbeck et al, as art-recognized equivalent means for providing cooling to the substrate support. It has been held that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). See MPEP 2144.06 II.

49. Parkhe in view of Strodbeck et al do not teach the means for heating comprises at least one of a thermoelectric device and a means for receiving fluid comprises a channel to flow at least one of the elevated temperature fluorinated dielectric liquid, water, and steam.

50. Hisai teaches a substrate support (*Hisai, 11 Fig. 1*) with a substrate placed thereon (*Hisai, W Fig. 1*) that is comprised of a heater (*Hisai, 17 Fig. 1*) that heats the working fluid (*Hisai, 16 Fig. 1*) through an internal space with a plurality of rims that

implicitly form channels which move, or flow the liquid therein, thus being a means of heating as a thermoelectric device with a means of receiving a fluid in the means for heating to flow an elevated temperature liquid (*Hisai, Para. 0028-0032*).

51. It would have been obvious to one of ordinary skill in the art at the time of the invention, with a reasonable expectation of success, to alternatively substitute the heating component in Parkhe with the thermoelectric heating means and fluid receiving means as taught by Hisai, as art-recognized equivalent means for providing cooling to the substrate support. It has been held that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). See MPEP 2144.06 II. The resulting apparatus would fulfill the limitations of claims 45-47, as the substitution of the elements into Parkhe would have the same arrangement and means for connecting.

### ***Conclusion***

52. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- **U.S. Patent No. 6646233 to Kanno et al with heating component on top of cooling component with cooling channels between the two components.**
- **U.S. Patent Application No. 2003/0228772 to Cowans, with heating and cooling grooves with a liquid there between (See Fig. 2).**

53. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIFFANY NUCKOLS whose telephone number is (571)270-7377. The examiner can normally be reached on Monday through Friday 9:00AM - 5:30 PM.

54. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

55. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TIFFANY NUCKOLS/  
Examiner, Art Unit 1792

/Parviz Hassanzadeh/  
Supervisory Patent Examiner, Art Unit 1792